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SOCIETY OF ARTS.

FRIDAY, MAY 27th, 1853.

TWENTY-SECOND ORDINARY MEETING,

Wednesday, May 25th, 1853.

THE Twenty-second Ordinary Meeting of the Society was held on Wednesday, the 25th instant, Thomas Winkworth, Esq., in the chair.

The following were elected Members :

Fales, William, Sheffield-terrace, Kensington.
 Levy, Moses, 26, Upper Harley-street.
 Power, David, The Cloisters, Temple.
 Richards, Theophilus, Birmingham.
 Simmons, Capt. J. L. A., R.E., Board of Trade.
 Vaughan, Charles John, D.D., Harrow.
 Vaughan, David James, M.A., Trinity College, Cambridge.
 Ward, the Rt. Hon. the Lord, Dudley House, Park-lane.
 Wylde, R. G., 11, Eaton-place South.
 Ysasi, Don Manuel de, Club Chambers, 15, Regent-street.

and the names of five Candidates for Membership were read.

The following Institutions have been taken into Union :

266. Hertford, Mutual Instruction Society.
 267. Liverpool Collegiate Institution.

The Secretary announced that the Council had determined that the Annual Meeting for the distribution of the Prizes that had been adjudged during the past Session, should be held on Friday, June 10th, at half-past four o'clock, r.m. precisely; and that His Royal Highness the Prince Albert, the President, had graciously expressed his willingness to preside on that occasion.

— The Secretary also drew the attention of the members to a magnificent series of volumes, relating to the Great Exhibition of 1851, recently presented to the Society by the Royal Commissioners; and read the following letter which accompanied them, from the Secretary of the Commission :

Board of Trade, May, 1853.

SIR,—I am directed, by her Majesty's Commissioners for the Exhibition of 1851, to transmit herewith a complete set of the various works, illustrative of the Exhibition, that have been prepared by their orders for the purpose of presentation to Foreign Governments, &c. The set in question comprises the following series of volumes, nine in number:—"Jury Reports, Illustrated with Photographs of Articles Exhibited," 4 vols.; "First and Second Reports of the Commissioners," 1 vol.; "Illustrated Catalogue," 3 vols.; "Medals struck by Order of the Commissioners," 1 vol.; and her Majesty's Commissioners direct me to request the Council of the Society of Arts to accept this present at their hands on behalf of the Society.

The Commissioners are desirous of availing themselves of this opportunity of expressing the high sense entertained by them of the very valuable assistance which they have received, through the whole course of their labours, from the Society of Arts. They feel that that Society, by means of the early Exhibitions instituted by it, first showed the possibility of the successful realisation of the great International Exhibition of 1851; whilst the bene-

fit of its co-operation has at all times been freely given by it to the Commissioners from the date of the issue of the Royal Commission. It was by members of the Society of Arts, again, that a large proportion of the most zealous and efficient services rendered to them by *individuals* was afforded; and a further proof of the sympathy of the Society is to be seen in the institution by it of the interesting series of Lectures on the results of the Exhibition, which have lately come to a close.

It therefore affords her Majesty's Commissioners much pleasure to have it in their power to record, in a permanent manner, by means of the slight tokens that accompany this letter, their appreciation of the cordial co-operation of the Society of Arts, Manufactures, and Commerce, towards bringing the Exhibition to its successful issue. I have the honour to be, Sir,

Your most obedient servant,
 EDGAR A. BOWRING.

E. Solly, Esq., Society of Arts,
 John-street, Adelphi.

A paper was then read, "On Recent Improvements in Chronometers," by Mr. Loseby.

The paper commenced with a general description of the different parts of a chronometer, divided into the train, the escapement, and the balance, with its spring; and after giving various reasons to show the small advantage that could be derived from perfection of form in the train wheel teeth, it proceeded :

We now arrive at the escapement, and here the first material difference between one kind of watch and another presents itself.

The chronometer escapement was then described with the aid of large drawings, and the various points noticed which constitute its great superiority over all other balance escapements, and Mr. Loseby proceeded :

It is a general opinion that the chronometer escapement is more subject to injury than the lever, and some other of the common escapements; so far, however, as concerns its liability to accident in actual use, I believe this opinion to be erroneous; for I have never known an instance where the detent has been broken in use, and the balance staff and other portions are quite as easily injured in the lever escapement as they are in the chronometer.

The various adjustments necessary in chronometers were then enumerated, which were styled the *mental* workmanship, to distinguish it from the *mechanical*; as the most practised eye could not discover whether they had been made or not, and hence the great difference in value which may exist between one chronometer and another. After describing the isochronous adjustment for change of arc and the adjustment for positions, the paper proceeded :

The second adjustment refers to the compensation for change of temperature; and this brings us to that part of the subject to which it is my intention in this paper more particularly to allude, from its being the only portion of the chronometer in which any well-established improvement has been made within the last half century; all the finest chronometers being constructed, with this exception, precisely as they were fifty years ago.

The ordinary compensation balance was then described with the aid of diagrams, and the

method of adjusting it, and Mr. Loseby then proceeded :

In speaking of the finest chronometers, those having the ordinary balance cannot now be included, as their errors, when most perfectly adjusted, are still sufficiently large to be seen without very long trials, on account of what is generally called the supplemental error. This cannot be corrected by the ordinary means, as the balance spring loses elastic force at an accumulating rate over the effect produced by the compound lamina of the balance, and consequently the chronometer can only be adjusted to keep the same rate at two points on the thermometer, between which it will gain.

The following appear to me to be the conditions which a perfect compensation for the secondary error should fulfil :

1.—It should gradually accumulate in effect from one extreme of temperature to the other, in the progression required by the change of elastic force in the balance spring.

2.—The secondary compensation should be susceptible of adjustment by rule alone ; for if this could only be effected by actual trial, as in the primary compensation, the extra time required would preclude the probability of its coming into general use.

3.—After it has once been adjusted the compensation should remain permanent and not liable to derangement.

4.—The secondary compensation should not interfere in the slightest degree with the action of the primary compensation ; for as the motion of the laminae in a large box chronometer only amounts to $\frac{1}{16}$ of an inch, to produce a difference in the rate of 380 seconds a day, in a change of temperature from 32° to 100° Fah., any such interference would eventually prove fatal to the chronometer's good performance.

With reference to the first condition, I find by a great number of experiments and trials, extending over a period of ten years, partly made by myself and partly conducted at the Royal Observatory, Greenwich, that the law of loss of elastic force in the spring, requires $\frac{1}{16}$ of the entire compensation to increase over the effect produced by the compound lamina, in the progression shown on diagram, where the distance gradually accumulates throughout.

The different plans proposed for removing the defect were divided into two classes, one of which included those methods in which auxiliary weights were brought into action at certain temperatures ; the other, the plans intended to produce an accumulating effect throughout.

The first class was represented by Mr. Eiffe's balance, and the second by Mr. Dent's, which were described by the aid of drawings, and their capabilities examined with reference to the conditions already laid down.

The last method introduced was that patented by Mr. Loseby, in which mercury is employed to effect the secondary compensation. The principle and action of this balance were fully described, and its ability to fulfil the necessary requirements tested by the conditions before applied to the others ; and after noticing the object for which Le Roy employed mercury in the balance during the last century, the paper proceeded :

Having now considered the constructions them-

selves, and the principles on which they are based, I will proceed to notice the results obtained in actual trial.

Fortunately, in this country as in others, the Government has instituted trials of chronometers for many years past, and thereby afforded a practical test of the advantages to be derived from the improvements proposed from time to time : and at the present day, before any addition can be recognized as an improvement, it must have successfully established its title in the sharply-contested trials of the Royal Observatory.

Mr. Loseby then proceeded to give an account of these trials, from two letters on the subject addressed to the Board of Admiralty ; one written by Mr. Dent, and the other by himself, from the latter of which the following Table is extracted, with the remarks immediately preceding it.

In extracting a summary from the rates, to show the reliance that can be permanently placed on the different constructions, I have included a period of five years, as the rates exhibit great uncertainty of the same maker maintaining the same position one trial with another ; not, however, that this will favour my chronometers, for they have not only obtained the first position, but kept it four years out of the five.

The first Table consists of the errors of all the chronometers added together for the several years, and a mean taken of the whole ; and the second Table contains the errors of my chronometers in the same years, so that a comparison of the two will show the amount of superiority on my chronometers over the general average.

ABSTRACT FROM THE RATES OF ALL THE CHRONOMETERS (140) WHICH HAVE BEEN TRIED AT THE ROYAL OBSERVATORY, GREENWICH, FROM 1848 TO 1852.

Year.	Difference between the greatest and least weekly rate.	Greatest difference between one week's rate and the next.	Trial No.
	s.	s.	
1848	27.2	12.9	53.0
1849	34.0	23.4	80.8
1850	37.0	24.5	86.0
1851	29.6	17.5	64.6
1852	28.5	19.3	67.1
	156.3	97.6	351.5
Mean of 5 years	31.3	19.5	70.3

ERRORS OF LOSEBY'S CHRONOMETERS IN THE SAME TRIALS.

Year.	Difference between the greatest and least weekly rate.	Greatest difference between one week's rate and the next.	Trial No.
	s.	s.	
1848	11.0	5.6	22.4
1849	17.3	9.2	35.7
1850	12.7	4.7	22.1
1851	16.5	4.4	25.3
1852	11.7	9.4	30.5
	69.2	33.3	136.0
Mean of 5 years	13.8	6.7	27.2

Since 1848 the trials have been rendered more severe by the chronometers being exposed to greater extremes of temperature.

The CHAIRMAN, in inviting discussion on the paper just read, said, that owing to the lateness of the hour, there would not be time to do justice to Mr. Wenham's paper; the reading of it would, therefore, be adjourned, together with any additional discussion on the present paper, until a future evening.

Mr. DENISON hoped, that every one interested in this question would expend twopence in the purchase of the Parliamentary Paper, No. 69, of this Session, containing Mr. Dent's letter. In regard to Mr. Loseby's answer to that letter, it simply suggested that Mr. Dent, in dividing the twenty-four weeks into three periods, was unfair, and his statements incorrect. He, Mr. Denison, had examined all the Greenwich lists, and he found that the only mistakes Mr. Dent had made were against himself. Then as to the fairness of Mr. Dent's plan: they must first inquire what secondary compensation was for? It was to prevent chronometers gaining at mean temperature when they were adjusted for extreme temperatures, and they wanted to get a period of, going, at each temperature as long as possible. As, however, there were only twenty-four weeks for trial, they could only get eight weeks of each temperature. This Mr. Dent had done, and the question was, had he done it properly? The Greenwich lists were made from January to July; the first eight weeks were the coldest, the eight middle weeks were nearest the mean temperature, and the last eight weeks of the twenty-four were the hottest. This was the best division they could get in England, and although there would be variations during each eight weeks, it did not do to split hairs in such an inquiry. What Mr. Dent has done was simply to take the temperature as given at Greenwich, and in taking each eight weeks he had estimated as fairly as was possible the causes of the variations. There were oscillations independent of temperature; but these they had nothing to do with. It was clear that in a country where they had but half a year's changes, the plan Mr. Dent pursued, if not absolutely true in its results, was the best they could get.

Mr. Denison then read the following Table of the comparative rates during equal periods of eight weeks, of cold, mean, and hot temperatures, of the most successful chronometers tried at Greenwich in the past five years, referred to by Mr. Loseby:

1848; range of temperature, 28° to 87°—	Cold.	Mean.	Hot.
Loseby	+ 1	+ 5·5	+ 3·3
Loseby	+ 1·7	+ 8·8	+ 5·1
Massey	— 2·3	— 2·8	— 3·1
1849; temperature, 40° to 91°—			
Loseby	+ 7·7	+ 12·1	+ 18·1
Eiffe	— 6·2	— 7·6	— 10
Poole	— 9	— 5·8	— 3·6
1850; temperature, 22° to 105°—			
Loseby	— 9·7	— 6·9	— 9·2
Dent	— 8·6	— 7·5	— 8
1851; temperature, 28° to 109°—			
Loseby	— 1·7	— 3·2	— 9·8
Lawson	— 3·5	— 2·2	— 4·2
1852; temperature, 21° to 115°—			
Loseby	— 9	— 6·5	— 6·7
Dent	+ 4·6	+ 3·6	+ 4·8

The result was that Mr. Loseby's chronometers had been beaten every year with respect to the secondary compensation, for which his invention was designed; once by Massey, Eiffe, Poole, and Lawson, and twice by Dent; and moreover, that in two out of the three years since the trials became more severe as to range of temperature, Dent's chronometers had beaten all the others

in the accuracy of the compensation; consequently Mr. Loseby's compensation could not be regarded as superior, or even equal to several others which were invented before his. What Mr. Loseby had effected was, by the devotion of his mechanical skill, the getting up of one chronometer annually of very great accuracy, as Mr. Dent had done in 1829; but that was a trial of skilful execution, not of scientific improvement. For this mechanical skill Mr. Loseby deserved great credit; and he, Mr. Denison, in his capacity of Reporter on Horology at the Great Exhibition gave him all praise for his execution. His chronometers were not the best, however, for secondary compensation, nor would they be whilst those of Eiffe, Poole, Massey, Lawson, and Dent remained.

The CHAIRMAN intimated that the paper of Mr. Wenham would be read on Monday evening next, and the discussion of the present paper would also stand adjourned to the same evening. He proposed a vote of thanks to Mr. Loseby for his paper, which was carried unanimously.

It was announced that, on Wednesday next, June 1st, being the last Ordinary Meeting of the present Session, the Council had determined to bring before the Society the Government Announcement of the Universal Exhibition at Paris, in 1855, and to appoint a Committee with a view to promote the due representation of British manufactures, and to report on what steps may be taken for obtaining the removal of those restrictions that would at present interfere with the full representation of British manufactures in France, in 1855.

THE OFFICE OF SECRETARY.

THE Council think it right to announce that, on June 8th, they will, pursuant to the Bye-Laws, proceed to the selection of a Secretary, whose name will be placed in the next Annual Balloting List, with those of the other officers of the Society, for election at the Annual General Meeting.

The Council consider it due to the members to make this announcement, as they learn that candidates are now canvassing the members, which the Council deem premature, and likely to lead to inconvenience.

CONVERSAZIONE AT THE MANSION HOUSE.

THE Lord Mayor, having invited the co-operation of the Council of the Society of Arts in promoting the objects of the Conversazione, and in procuring educational models and apparatus for exhibition on that occasion, they have issued the following circular to the Principals of Educational Institutions:

"Society of Arts, Adelphi, May 20th, 1853.

"SIR,—The Council of the Society of Arts have learned with much pleasure that the Lord Mayor has invited the Mayors of most of the cities and towns in the United Kingdom to a conference at the Mansion House on the 8th June next; to consider the present endeavours of the Government to extend a more general and a more practical study of science and art, as branches of the education of all classes of the community.

"His Lordship has also invited a large and distin-

guished party of persons interested in this question, as well as the delegates from the mechanics' institutions in Union with this Society, to meet the mayors on the same evening, and to give to them all an opportunity of meeting and conversing upon this highly important subject, which has been lately brought specially under the consideration of the Society of Arts.

"The Council consider that advantages may arise from this public-spirited proceeding on the part of the chief magistrate of the City of London, as important to the progress of education as those which were derived from the memorable entertainment given by Mr. Alderman Farncombe when Lord Mayor, in 1850, which preceded the Great Exhibition. The Council of the Society, in which the Exhibition originated, consider themselves bound to yield to his Lordship every assistance which it is in their power to bestow.

"The Council have considered that they might add to the value and practical character of the Conference by aiding his Lordship in collecting specimens of educational models, books, apparatus, and modes of instruction, of which experience has proved the success, and which it is desirable should be more generally known.

"I am therefore directed to inquire whether it would be possible to supply from the Institution with which you are connected, any articles; such as books, instruments drawing examples, diagrams, maps, models, philosophical apparatus, or other articles which may in any degree illustrate the mode of instruction followed, and also if you could make arrangements for a person to be at hand, to afford explanations.

"It is his Lordship's present intention to hold a second *Conversazione* within a short time; it would therefore be desirable if you could make arrangements to leave such articles at the Mansion House in the interval.

"I am, Sir, your very obedient Servant,
"EDWARD SOLLY, Secretary."

The Council have also issued a circular to the Manufacturers of educational apparatus, of which it may suffice to give the following extract:

"The Council understand that you have paid particular attention to the production of such articles, and it has been suggested to them that you and others in the same line of business would be glad of such an opportunity of affording information respecting the articles produced by you; and if so, they will make arrangements to place a certain space at your disposal, on which you may display any books, diagrams, apparatus, &c., having reference to education.

"It would be desirable that the articles should remain for a short time, as his Lordship proposes holding a second *Conversazione*. It would also be as well that some person should attend on your behalf, to give explanations as to the mode of using the apparatus, price, and other particulars.

"Every reasonable precaution will be taken for the security of the articles, but his Lordship thinks it right, to say that he cannot charge himself with responsibilities for loss or accident."

COMMERCIAL EDUCATION AND TRADE MUSEUMS.

The following interesting letter appeared in the *Liverpool Albion*, of May 23rd:

Collegiate Institution, May 21, 1853.

DEAR MR. MAYOR,—No one will be surprised that I

should address you on the subject of commercial education. 'My business in life is the practical work of education in the second commercial town in the world. You are the chief magistrate in that town, and you have always been known for your lively interest in all branches of industry, and your sympathy in every effort to improve and elevate the condition of your fellow-townsmen.

It is quite evident that this country is in a critical condition as regards industrial instruction. The Exhibition of 1851 showed us very clearly that there is some danger of our being outstripped in the race of competition. The value of our local advantages has been in a great measure neutralised by increased facilities of locomotion: and it is generally agreed that the success of our efforts to maintain our pre-eminence in the practical arts will hereafter depend more on intellectual than physical causes.

Under the influence of these convictions, the Government Department of Practical Art and Science has been organized in connection with the Board of Trade—and, as it seems to me, very wisely organized, on the principle of giving aid to local Institutions without interfering with local self-government. In these circumstances, the large towns of England are practically asked what response they are disposed to give to the well-known sentence in the Queen's Speech on Nov. 11th, and how far they are prepared to avail themselves of the facilities which may be placed at their disposal by the Government. Liverpool, among other places, will presently be called upon to answer this question.

One answer which will probably be given by Liverpool, in common with other towns, will be the more general introduction into schools of some courses of instruction which have a direct bearing on the utilities of life, and the gradual adoption of such apparatus as the Government may be able to place on cheap terms within their reach. All this is evidently within the power of managers of schools; and their judgment will be shown by maintaining the due balance among different studies, and by holding a right course between too ready a compliance with a prevailing movement, and too strict an adherence to older precedents. Any attempt to turn schools into workshops will lead to disappointment; and if the highest purposes of education are sacrificed to mere utility, nothing but harm will be the result.

When, however, I look beyond the walls of our schools, and think of industrial instruction in its widest bearing on our whole population, I cannot but feel that this response would be inadequate and unworthy of Liverpool. Among the results of the Great Exhibition, it seems to be now understood that we are to look for the formation of a great Central Museum of Art and Manufactures, which of course will be situated in the metropolis. The usefulness of such an institution will hardly be disputed; but in order that its benefits may be fully diffused over the country, similar museums must be called into existence in all our great centres of industry. And it appears to me, that such collections ought not to be mere copies on a small scale of the collection in London—not miniature repetitions of every portion of the metropolitan institution, but rather full and detailed representations of whatever department of the Central Museum has special reference to the prevailing industry of the place where the Provincial Museum is situated. It would be easy, for instance, to define the nature of the collections which would be appropriate to Manchester, to Birmingham, and the Potteries. The great business of Liverpool is Commerce; and, without entering into details which would only encumber this letter, I will just say that it would be worthy of the enterprise and

public spirit of this place, if it were resolved that the Trade Museum of Liverpool should be grander and more complete than the Trade Department of the Central Museum at Kensington Gore.

Yet even a museum of this kind, useful and impressive as it would be, would be comparatively valueless, if no active courses of instruction were connected with it and based upon it. And this leads me to mention another subject, which, in my judgment, is well worthy of the attention of the merchants of Liverpool. Nothing is more painful to a schoolmaster who wishes to do his duty, than the early age at which boys are taken from school and sent to business. They are frequently removed at the very time when their improvement is just beginning; and, from the nature of the occupations into which they are thrown, their education is too often practically arrested in early boyhood. I am very well aware of the difficulties with which this subject is beset; and I do not doubt that many parents would be glad to see a higher education combined with the experience which must be acquired in an office. Is it not possible that these difficulties might in some measure be overcome, and these wishes partly accomplished, if higher courses of instruction could be organized, which might succeed the regular school training, and have a direct reference to the requirements of Liverpool? Might not many parents thus be induced to continue the education of their sons to a later point of that critical period which extends from fourteen to twenty years of age? I am suggesting what, in fact, would be a Commercial College, or a section of some great Industrial University. It would not be difficult to define the proper courses of instruction, which, as in the case of the museum, should have a strictly local reference. Physical geography, natural history, chemistry, the history of commerce, mercantile statistics, international law, are among the topics which immediately occur to the mind.

I could easily write at much greater length; but my simple object has been, by the aid of your name, to invite general attention to this subject. If this letter should meet with favourable attention, I shall be glad hereafter to lay before the public some suggestions in more minute detail.

I have the honour to be, dear Mr. Mayor, your very faithful servant,

J. S. HOWSON, M.A.,
Principal of the Collegiate Institution.

To Samuel Holme, Esq.

OXFORD UNIVERSITY MUSEUM.

At a meeting of the Oxford University Museum Committee, held on Thursday last, the draft of the subjoined Report was read, and, on the motion of Dr. Daubeny, seconded by Mr. Maskelyne, adopted for circulation in the University:

REPORT.

"The Oxford University Museum Committee have thought it expedient to lay before members of Convocation a succinct account of the present condition of the undertaking to which their attention has been drawn for several years.

"It is presumed that the circumstances which in 1847 led to the conviction that a new museum was required are well known—namely, that the Ashmolean Museum, the rooms for the geological collection, for the mineralogical collection, for the apparatus of the reader in experimental philosophy, were all, even then, insufficient for their several purposes; that there was no accommodation or collection provided by the University for either of the

professorships of medicine, for the professor and reader of anatomy, no apartments for the professor of astronomy, nor for the professor of geometry, nor for the Sedleian reader in natural philosophy; that the inconvenience and loss in having the institutions that did exist separate and detached was great, and that for the practical work of students there was no accommodation whatever.

"To remedy this state of things was in 1847 desirable. Now (if the Natural Science School be not destined to become a dead letter) it is necessary. Accordingly, a site has been decided on for the new edifice; and the wants of the University have been stated in a few words by the delegacy appointed on February 17th last, 'to consider what museums, lecture-rooms, and other buildings are required for the study of natural history and physiology.'

"It remains to select a plan, and commence the work. Whatever plan be adopted, it is not necessary to complete the whole structure at once. But it is most expedient that any scheme which is approved should be at once philosophical, compact, convenient, and conceived not only for our present needs, but for posterity.

"In the opinion of the Committee, the report of the delegates, while sufficiently moderate in its proposals, combines these requisites; and if there be any particulars in which it may not come up to the expectations which may be entertained of a great university, it provides, as indispensably necessary to the design, that the building must be capable of extension in each and all of its departments.

"The Committee, therefore, earnestly recommend the report for adoption; and the result of this adoption, they hope, may be the early appointment of another delegacy, not for the immediate erection of the whole, but for the obtaining plans from architects for selection and approval. And they are the more urgent in their desire that this may be accomplished, because the University, by obtaining plans, will gain a more thorough conception of the required edifice, and of the wants of the University, and a more exact knowledge of the cost of supplying them, inasmuch as no architect could expect to compete with success in such a work who is not well acquainted with the great museums of Europe, and who has not ascertained the principles and mastered the details requisite for an institution, in which the natural history of the earth and its inhabitants is to be illustrated for a great educational purpose."

NEW PATENT LAW.

THE following extracts from a treatise on this subject by Mr. T. Webster, will be regarded with interest:

"THE system established by the Patent Law Amendment Act must be regarded as the foundation whereof the superstructure has yet to be raised under the sanction of further legislation. The Act has swept away the foundation and sources of great abuses, and established a system having the following cardinal features: 1. Protection from the day of application. 2. One patent for the United Kingdom. 3. Moderate cost and periodical payment. 4. Printing and publication of specifications. 5. One office of patents and specifications. The Committee of the House of Commons introduced alterations, which, although not destroying the leading features of the new system, have materially impaired its efficiency, and which will occasion unnecessary trouble and expense and further legislation.

"Some of these alterations, so far as they interfere with the beneficial operation of the system established

by the Act, have been already noticed; but other alterations of a more important character affecting the ultimate success and credit of the new system remain to be noticed. These may be regarded as omitted objects, and which must form the subject of further legislation. Some of these objects were prominently brought forward by Sir A. E. Cockburn, A.G., in moving the second reading of the Bill in the House of Commons in the Session of 1851, so that no doubt can be entertained as to the views of its promoters.

"Such were the terms in which the Bill of 1851, as sent from the House of Lords, was introduced to and received with acclamation by the House of Commons; the Bill of 1852, as sent from the House of Lords, with provisions for effecting the same objects, was referred to a Committee of the House of Commons; during the progress of the Bill in that Committee, the clauses for referring the provisional specification to examiners were struck out, and clauses referring the provisional specification to the law-officers was substituted; other apparently trifling alterations were made; the combined effect of which, however, was to retain and import into the new system most of the defects so strongly pointed out by Sir A. E. Cockburn, as connected with the tribunal of the law-officers.

"Upon the subject of the examination under the proposed system, considerable misconception existed in the minds of many members of the Committee; but the imminent danger which impended of the Bill being again defeated by want of time, rendered it inexpedient that anything should be done which might occasion delay. No opposition therefore was prosecuted to such alterations; the members of the Committee, who were thoroughly acquainted with the wants and wishes of inventors and manufacturers, thankfully accepted any portion of the measure as a first and great instalment of reform; and regard being had to interests in the three countries, which were pressed upon the Committee, and to the conflicting nature of the views suggested by the opponents of reform, the public are greatly indebted to the Committee collectively, for having saved so much of the original measure.

"The provisional specification and preliminary examination were intended to afford protection to the inventors and to the public. The visionary nature of many of the projects, and the visionary character of their authors, are notorious; the provisional specification and its examination by competent persons are calculated to check the mere speculative inventor, whose supposed invention in the majority of cases will not admit of being expressed in distinct and intelligible language. Such an examination would check the majority of applications at the first stage, and save further expenditure to the inventor, and the creation of privileges of no use but to invite and encourage litigation. The provisional specification and preliminary examination were approved of by almost every witness examined before the Select Committee of the House of Lords on the Bill of 1851, as affording a guarantee of the kind required. The opponents of patent law reform assigned much more extensive duties to the examiners than either the promoters of the measure, or the witnesses who gave evidence on the subject. The duties assigned were the satisfying themselves that the description was clear and intelligible, and that the invention was sufficiently defined; and many of the witnesses referred in support of these views to the beneficial operation of such examination under 'The Protection of Inventions Act, 1851.' It is true that some of the witnesses spoke in favour of the opinion, that such a board ought to or might judge

conclusively on the question of novelty, but few concurred in that opinion.

"This duty of preliminary examination spoken to by almost every witness as of paramount importance, and as requiring time, knowledge, and attention, which the varied occupations and frequent changes of the law officers precluded the possibility of being adequately discharged by them, however great their scientific as well as legal acquirements, the Committee of the House of Commons thought fit to impose upon the law-officers, with whom now rests the responsibility, of certifying the sufficiency of the provisional specification, and that it states distinctly and intelligibly the whole nature of the invention, so as to apprise the law officers of the improvement, and of the means by which it is to be carried out.

"Time will show the result of this alteration in a fundamental principle of the measure, not only without any evidence to guide the Committee, but in direct opposition to the most positive evidence on the subject. If inventors, relying on the certificates which have been given, should be grievously disappointed in the result, it must not be laid to the new system, but to those who deprived that system of this great safeguard, and of the means of correcting evils and of relinquishing duties which the experience of all law officers had led them to wish to entrust to other persons.

"The reduction of the cost of patents has in this, as in other countries, acted as a great stimulus to invention, having placed the means of obtaining protection for and creating property in inventions within the reach of classes formerly excluded; but the corrective to such stimulus, as applied in every other country, is wanting, and no practical check upon the applications at present exists. The result is, that every inventor is tempted and induced to proceed through the successive stages, and to incur the whole cost of the patent—a consequence beneficial to his professional advisers, but very detrimental to the credit of a system framed with the view of preventing useless expenditure of money and time, and of checking as much as possible the creation of useless privileges.

"The evil last adverted to, namely, the stimulus which exists to prosecute every application for a patent, is augmented by another alteration, which gives colour for the opinion that the provisional specification was to be a secret document.

"This is contrary to the intentions of the promoters of the original measure, and to the spirit of the Bill of 1851. It might be expedient so long as any considerable number of patents granted under the old system remained unspecified, that the provisional specifications should be secret documents; but the period for the enrolling of such specifications having passed, the provisional specifications, when certified as sufficient, ought to be open to inspection. The Speech of Sir A. E. Cockburn, already quoted, assumed this; and the great object of provisional protection, namely, that a party may avail himself of the experience and knowledge of others, leads to the same conclusion.

"Further, the public and inventors have a right to know at the earliest moment, consistent with the security of the inventor, from what they are debarred; and it is contrary to public policy that such secrecy should exist. Such secrecy is an encouragement to crude and immature schemes, and injurious to inventors, who have a real interest in knowing at the earliest moment the demerits of their inventions.

"To suggest that fraudulent persons might thereby acquire a knowledge of the invention, and by means of

such knowledge oppose the patent at a later stage, is to import into the new one of the crying defects of the old system, namely, that mere possession of an invention was a ground for opposing a patent, and to disregard the principle of the new system, that the first applicant has the *primâ facie* right.

"The suggestion of prejudice to the foreign patents is of the same character; no person ought to apply for a patent whose invention is not sufficiently matured to furnish a description for the foreign patents, and a short interval, as a fortnight, between the deposit of the provisional specification and its being open to inspection, would afford all the security that can be required in respect of the application for the foreign patents."

PRACTICAL DIRECTIONS FOR OBTAINING LETTERS PATENT.—The invention having been sufficiently matured, a proper title must be selected.

"A title having been selected, the provisional, or complete specification, as the case may be, must be prepared and written on paper or parchment of the proper size, and signed by the applicant, or the agent of the applicant, in the case of a provisional specification.

"The petition and declaration must then be prepared; the declaration is to be made before a Justice of the Peace (at any one of the police-offices in the metropolitan district), or before one of the Clerks for taking affidavits, at the Clerks' office, in Chancery-lane, or before a Master Extraordinary in Chancery or Justice in the country.

"The petition, declaration, and provisional or complete specification (care being taken that they agree with each other in the title of the invention and in the names and description of the applicant), with a stamp of 5*l.* affixed to the petition, are to be taken to the office of the Commissioners of Patents, in Southampton-buildings, Chancery-lane, and left there, when a receipt will be given.

"The applicant, after the allowance of the provisional protection shall have been advertised, if he be still minded to proceed for the patent, must give notice at the Office of the Commissioners of his intention to proceed, which, being recorded, with a stamp of 5*l.*, will be duly advertised.

"If no opposition be entered, the warrant of the law-officer, also bearing a stamp of 5*l.*, will be made out, and upon that the patent, also bearing a stamp of 5*l.*, will be issued from the Office of the Commissioners.

"These four several sums, or stamps, of 5*l.* are the only moneys which the applicant has to pay in the case of an unopposed patent.

"The opponent of a patent must leave particulars of objections at the Office of the Commissioners, with a stamp of 2*l.*

"Should the applicant after this proceed with his patent, a hearing will take place before the Law-officer, when the applicant and opponent will each have to pay—

To the Law-officer - - - £2 12*s.* 6*d.*

To his Clerk - - - 0 17 6

being the amount settled in the manner directed by the statute.

"The Law-officer, after hearing the parties, will grant or refuse his warrant, and give such directions as to costs as he may think fit.

"The patent, if the warrant be allowed, will be obtained from the office of the Commissioners as before.

"The complete specification, in cases in which a provisional specification had been deposited in the first instance, must be filed in the office of the Commissioners within six months from the date of the application; this also will bear a 5*l.* stamp."

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS, May 24th, 1853. J. M. Rendel, Esq., President, in the Chair. The paper read was "A Description of the Newark Dyke Bridge, on the Great Northern Railway," by Mr. J. Cubitt, M. Inst. C.E. The structure consisted of two separate platforms, one for each line of rails, carried upon two pairs of Warren's trussed girders, each composed of a top tube strut, of cast iron, opposing horizontal resistance to compression, and a bottom tie, of wrought iron links, exerting tensile force; these were connected vertically, by alternate diagonal struts and ties, of cast and wrought iron respectively, dividing the length into a series of fourteen equilateral triangles, whose sides were 18 feet 6 inches long; the actual span of the girders being 240 feet 6 inches. Each tube was composed of twenty-nine cast-iron pipes, of 1½ inch metal and 13½ inches diameter at the abutment ends, increasing to 18 inches diameter with 2¾ inches metal at the centre of the span. The lower tie consisted of wrought iron links 8 feet 6 inches long, of the uniform width of 9 inches, but varying in number and thickness, according to the tensile strain to which each portion was subjected. The diagonal tie links varied from 9 inches by 1½ inch to 9 inches by ¾ inches. The cast iron diagonal struts had a section resembling a Maltese cross, the area being in proportion to the compressive force to which they were subject. The total weight of metal in each pair of girders, composing the bridge, was 244 tons 10 cwt., of which 138 tons 5 cwt. were cast iron, and 106 tons 5 cwt. wrought iron, which, with 50 tons for the platform, &c., made the total weight of each bridge 294 tons 10 cwt., or 589 tons for the whole structure; and the cost, exclusive of the masonry of the abutments, and of the permanent rails, but including the staging for fixing and putting together, and the expense of testing, was 11,003*l.* In a series of experiments to test the stability of a pair of the trussed girders, at the works of Messrs. Fox, Henderson, and Co., where they were constructed, the following results were obtained. With a weight of 446 tons regularly distributed, which was equal to 1½ ton per foot run, plus the weight of the platform, rails, &c., lowered seriatim on the thirteen compartments, the ultimate deflection in the centre was nearly 6½ inches. With a weight of 316 tons, equal to 1 ton per foot run, plus the weight of the platform, &c., as before, the ultimate deflection at the centre was 4½ inches. When the bridge was fixed in its place, a train of waggons, loaded up to 1 ton per foot run, extending the whole length of the platform, caused a centre deflection of 2½ inches. The deflection caused by two heavy goods engines, travelling fast, and slowly, was 2½ inches; and that produced by a train of five of the heaviest locomotive engines, used on the Great Northern Railway, was 2½ inches in the centre.

PROCEEDINGS OF INSTITUTIONS.

DARLINGTON.—On Friday evening last an excellent Lecture was delivered at the Mechanics' Institution by Professor Nichol, of Glasgow, on the extent of the material universe. The lecture was kindly offered by Dr. Nichol in aid of the Institution, and the attendance both of members, and others, was large. The lecture

was an eloquent discourse on the science of which the Professor is well known to be a distinguished votary.

LIVERPOOL.—The following lectures have been delivered in the Collegiate Institution between February and May; two on *Herculaneum and Pompeii*, by Mr. George Scharf, jun.; two on the *Philosophy of Sensation*, by Dr. Inman; three on *English Ballad Music*, by Mr. George Barker; one on *German Ballads*, by Mr. Grattan; two on the *Heroes of the Reformation*, by Mr. Lord (U.S.); two on *Christian Missions in India*, by Rev. J. Percival; and one on the *Mollusca*, by Rev. H. H. Higgins.

SEVENOAKS.—The first of a course of three Lectures, "On Physical Geography," was delivered on Thursday, the 19th inst., at the Literary and Scientific Institution, by Wm. Hughes, Esq., F.R.G.S., London. The subject will be divided into the "Ocean," "Earthquakes and Volcanoes," and the "Effect of the Atmosphere on Vegetable and Animal Life." The "Ocean" was the subject of the first lecture; its extent, movements, properties, and other phenomena, were enlarged on, and the lecture being illustrated by some well-executed maps and diagrams, made it the more interesting and instructive. Lectures at this Institution are continued throughout the year, at intervals of three weeks or a month, and are generally well attended.

STAMFORD.—At a recent meeting of the Members of the Institution, Dr. Hopkinson, the President, remarked that it was proposed to establish a class at the Institution for the instruction of children in certain branches of science not usually introduced in our schools. He considered the kind of information which it was intended to endeavour to impart at the meetings of this new class, would be of a character which was much needed, and would be most useful to young people; and he felt confidence in the success of the plan. He referred to the great interest taken by children in visiting the museum, and the anxiety and attention with which they listened to any explanation of its contents. These, he contended, were evident signs of a desire for information on matters which were strange to them; and it was with a view to supplying this blank, that he considered it desirable to give this new class a fair trial. In the course of his remarks, Dr. Hopkinson expressed his surprise that there still appeared to exist a certain jealousy with regard to the extension of education, and the spread of intelligence, when it was too obvious that many of our present evils arose from the want of sound and really useful education, and a higher degree of intelligence amongst the mass of the people. That the education now obtainable might be tolerably good for the wealthier classes, he did not deny; but for an extensive section of the great body of the people, who had but limited means, and for the poorer class especially, nothing could be worse or more defective than the present system.

WINCHESTER.—The annual general meeting of the members of the Mechanics' Institution was held on Wednesday evening, E. W. Faithful, Esq., Vice-president, occupying the chair. The report stated that the present number of subscribers was, members, 209; ladies, 31; juniors, 39; non-members, subscribing to the daily reading-room only, 14. The income for the past year, from all sources, was 210*l.* 7*s.* 8*d.* Considerable advantages had been derived from the union with the Society of Arts, and those advantages would increase as the arrangements of the union became perfected. The library had been considerably improved during the year,

principally by donations from members, and now contained upwards of 3,000 volumes. The establishment of a daily reading-room had been carried out most successfully. The meeting then proceeded to the annual election, when the following Committee of Management was chosen:—President, Rev. Charles Walters, M.A., F.R.A.S.; Vice-presidents, E. W. Faithful, Esq., Mr. R. Hayles; Treasurer, Mr. W. Moody; Secretary, Mr. Tammadge; Curator, Mr. H. Newman; Librarians, Mr. J. Lansley and Mr. H. L. Smith; and without special office, Rev. F. Bugby, Messrs. G. Hill, W. T. Bracewell, E. Ventham, J. Castill, J. Crathern, S. Ventham, W. Tanner, S. Reynolds, W. Budden, J. Head, C. Newman, S. Hobbs, H. Butcher, J. L. Jardine, and H. W. Framp-ton.

YORKSHIRE UNION OF MECHANICS' INSTITUTIONS—The sixteenth anniversary of this important Union was celebrated last week at Thirsk, and was attended by a large number of delegates and visitors. A meeting for conference and business was held in the morning; after which the delegates and visitors dined together at the Three Tuns Inn; and the proceedings were brought to a close by a tea-party and concert in the evening, which also took place in the public rooms. Mr. James Holc, the Honorary Secretary, read the report, from which the following is extracted:—At the last annual meeting the Union comprised 123 institutes, and this year it consists of 123, notwithstanding that 8 institutes have ceased their connection. Of the 8 institutes that have withdrawn, 5 have done so only because they ceased to exist. Most of them, your Committee regret to say, are in places where a population exists more than ample for the support of a prosperous institute, and even where a large amount of books and other property for the purpose still remain; and for the want of sufficient energy have been suffered to expire, as if, indeed, the presence or the absence of an institute was a matter of indifference, and incapable of exercising any influence on the welfare and prosperity of the place. Total number of institutes in the Union, 123. Total number of members reported in 86 institutes—males 14,962, females, 1,520; total number of members estimated in 25 institutes, 2,055; total in 111 institutes, 18,537. 23 institutes, neither report nor estimate. Total income reported of 81 institutes, 8,107*l.*; 42 institutes neither reported nor estimated. Number of volumes reported in the libraries of 86 institutes, 90,109; number of volumes estimated in the libraries of 21 institutes, 10,168; total in 107 institutes, 100,277; 16 institutes neither reports nor estimates. Circulation of books reported for 81 institutes, 300,553; 42 institutes neither reported nor estimated. Number of books added during the past year to the libraries of 77 of the institutes, 6,025. Periodicals reported in 77 institutes—weekly, 351; monthly, 507; quarterly, 57; total, 915. Total number of lectures delivered in 77 institutes, 665. Classification of 478 lectures in 67 institutes—scientific, 128; literary, 325; music, 25. During the past year your agent and lecturer, Mr. Thomas John Pearsall, has delivered 45 lectures, attended 14 soirées and other meetings, and visited 41 institutes for the purpose of conferring with the committees. 12 institutes declined receiving a visit, 17 made no reply; and, besides these, there were 15 institutes either temporarily suspended, discontinued, or withdrawn from the Union. The agent has reported to your Committee on the condition and prospects of the various institutes, and the general state of them appears to be very satisfactory and improving. That such is the case will be borne out by the following statement of the present condition of those

institutes which, having furnished returns both last year and this, enable a comparison of their progress to be instituted :

	1852.	1853.
Males in 75 institutes	11,722	12,062
Females in 57 ditto	1,347	1,326
Income of 71 ditto	£6,543	£6,986
Books in 73 ditto	64,019	73,909
Issues in 73 ditto	251,297	241,367
Lectures in 68 ditto	520	588

Your agent's report states, "In several places new buildings, or at least means of larger accommodation, are in contemplation. Bradford, business-like, has increased its accommodation at an expense of 800*l.*, and paid it off. Leeds has cleared off its mortgage debt. At Lockwood, near Huddersfield, it is likely that some steps will be taken for a building to provide for that place and the neighbouring villages. Churwell and Bramley contemplate some movement in this direction. At Batley, the foundation stone is laid for a new building for the institute and for town purposes, 750 shares being subscribed out of 1,000 before commencing. At Settle, I understand, a new and suitable building is under consideration. At Dewsbury, the plans are prepared for public rooms, and to accommodate the institute, at an expense of between 4,000*l.* and 5,000*l.*, about 2,000*l.* being already subscribed in sums of 200*l.* each; and other institutes are so far well situated that the raising of a building has been considered quite probable. Morley, Ripley, and Shipley, are of this class. Brighouse has a small but well-situated building, new this year, and, as I understand, built by the institute. At Kirkby Malzeard, the building is well advanced. At Rotherham, the new building is nearly ready. At Skipton, the land for a new building is secured, together with several handsome subscriptions. At Halifax, again, the land has just been selected on which it is intended to erect a building to cost 6,000*l.*; and to-morrow the first stone of the Darlington Institute will be laid, at which we trust many of the friends of education here to-day will be present." The advantage of the exertions to raise superior buildings for the purpose of the Mechanics' Institute is not restricted to the locality, but public spirit is awakened in other towns, which do not like to be behind their neighbours, and thus the general standard of intellectual activity is raised. One of the duties imposed upon us at the last annual meeting was, the obtaining of legal security for the property of institutions, in accordance with the carefully considered recommendations which our predecessors had obtained from competent legal authorities. The subject has not been overlooked, and the Committee's conviction of the importance of such legal protection remains undiminished. That no practical steps have been taken by us, has arisen from the fact, that the Union of Institutes in connection with the Society of Arts has devoted considerable attention to the same subject, and has intimated an intention of introducing a bill for the purpose into the legislature. In the last Report the Committee state that Mr. Traice had undertaken to revise the priced catalogue of books suitable to the libraries of Mechanics' Institutes, now out of print. The great additions recently made to this class of books, both in regard to their contents and cost, rendered a careful review of the works published within the last few years absolutely necessary. This has been carefully done, and the Committee are happy to state that the Catalogue is nearly ready to be placed in the printer's

hands, and it will be issued as soon as practicable. Another subject to which attention was directed at the last Annual Meeting was the distribution of selections from the Parliamentary papers among the institutes. Since then a Committee of the House of Commons has been considering the subject, and there is little doubt that the wishes expressed in the resolution on this subject, passed at the last Union meeting, will be realised. One subject which has engaged a portion of your Committee's attention during the past year, has been the formation of village libraries. In many villages it was thought that though there might be neither a building suitable for a Mechanics' Institute, nor a Committee able and willing to conduct its various departments, it might still be possible to introduce one of its most valuable features, namely, a library. We felt it to be, if not one of the objects of the Union, to be strictly in accordance therewith, and for these reasons, and others which will be found in a letter from your Secretary, appended to this report, we resolved on making an experiment to establish libraries in the villages adjacent to Leeds. A Committee was formed to collect donations for this purpose, consisting of the Rev. W. F. Hook, D.D., J. H. Shaw, Esq., mayor of Leeds, the Rev. W. Sinclair, and E. Baines and T. Wilson, Esqs. The result of the Committee's applications was the sum of 134*l.*, which it will be desirable to raise to 150*l.* Two difficulties, however, have presented themselves to the immediate realisation of the plan. The first is, that several villages have been found to possess good libraries, where your Committee had supposed none to exist. The plan was meant only to supply books to places without them, not to supersede the existing libraries which, it is to be regretted, are very much neglected by those for whose benefit they have been established. The other difficulty is, that even in villages, where no library at all exists, it is impossible to establish one until a person is found in each place who will take charge of the books. This difficulty may probably be obviated by your agent, Mr. Pearsall, visiting such places during the summer months, when he is not so actively employed by his institutional visits, and making arrangements with suitable persons in each locality. At Rothwell, two gentlemen have expressed their readiness to act as local librarians; and your Committee propose, as soon as librarians are found in eight more villages, to commence active operations. Your Committee would offer a few remarks upon the miserably small proportion of the working classes who participate in the advantages which these institutes ought to confer. Is it that the working classes are not in a state to avail themselves of such advantages, or is it that the institutes are not adapted to those for whom they are meant? Probably both these causes may operate. Want of early instruction, and consequent dislike to all but sensual and debasing pursuits, may in many instances be the cause. In others late hours of employment may exercise a mischievous influence. In some cases, again, even poverty may be an obstacle. All these causes have been, and still are, operative; but all are, happily, in the way of rapid removal. It behoves us, then, to see whether there are not defects in the Institutions themselves, which prevent them attracting within their walls those whom it is pre-eminently desirable to reach. In the first place, then, we believe that the institutions are not sufficiently educative; they do not afford the class of advantages, alike the most useful and the most highly prized by those who need their aid. We look for the remedy in a great increase of the class instruction. It often happens that many

of the village institutes have actually larger numbers absolutely, and very much larger relatively, to population, than the institutes in large towns. They are also producing a greater effect upon their members, most of whom belong to the manual labour class. The cause is solely attributable to the fact that they have discovered the main want of their subscribers, and brought all their energies to bear upon supplying that want. They have worked rather to make readers than to furnish books, and the consequence is that their little libraries are turned over many more times a year than in those institutes where the converse plan is pursued. The actual attendance of 59 institutes giving class instruction, and containing 11,813 members, is 2,810. It appears from the returns that even of the small proportion of members (under one-quarter of the whole) attending evening classes, four-fifths are in the elementary classes, as reading, writing, and arithmetic. It has been suggested by many persons who have wished to give Mechanics' Institutes a more practical relation to the pursuits of daily life, that certificates of merit should be awarded to those pupils who have passed through a certain prescribed course of studies. Such a plan was adopted in the Edinburgh School of Arts, in 1835, and has been continued with great success since that time. The pupil is required to give an attendance of three years,—mathematics employing the first year, chemistry the second, and natural philosophy the third. Any pupil who, after a proper examination, obtains an attestation of proficiency in each of the classes, obtains a diploma of life-membership, which gives free admission to the lectures, and admission to the library of the Institute, on payment of two shillings annually. Of the value of such certificate as a recommendation to employers, and an inducement to young men to study, it would be impossible to speak too highly. Your Committee are of opinion that no real and great improvements can be made in the classes without an addition to the fees paid in the large majority of Institutes.

TO CORRESPONDENTS.

Notice.—Members, and others, who can furnish or obtain original information or suggestions on the subjects included in the Society's Premium-list, or other topics connected with the Society's various departments of operation, are invited to communicate the same to the Secretary, in as condensed a form as possible, for the purpose of being either read and discussed at the evening meetings, or inserted in the Society's weekly Journal. Anonymous letters cannot be attended to. All communications, whether the author's name is to appear or not, must be accompanied by the writer's name and address.

Members of the Society who do not receive the JOURNAL regularly, are requested to give immediate notice to the Secretary; and, in order to prevent mistakes, they are particularly requested to signify any change which they desire to have made in their address, with as little delay as possible.

Country Institutions.—Correspondents who are so good as to send reports of proceedings of Local Institutions, are requested to forward them immediately after the Meeting to which they refer, and not later than Tuesday morning, if intended for insertion in the following Friday's Journal.

MISCELLANEA.

THE SUBMARINE TELEGRAPH BETWEEN ENGLAND AND BELGIUM.—On the 6th instant, a cable of seventy miles, in one entire length, was laid down between England and Belgium with complete success, and communications were instantly transmitted over 500 miles of submarine and subterranean line, with two of 24-plates battery only. The Mediterranean Electric Telegraph Company, propose to unite Europe with Africa by continuing the electric wires, which now run without interruption between London and Genoa, to Spezzia. From the latter port they will cross the Mediterranean to Africa, passing by the islands of Corsica and Sardinia. It is further proposed to construct a subterranean line from Algeria, along the coast of Africa to Alexandria; and, with the support of the British Government and the East India Company, it will be easy to prolong the wires to Bombay, where they will meet the great line of 3,000 miles now in course of construction by the East India Company. The farther end of this chain may ultimately be carried to Australia.

LAUNCH OF THE "HIMALAYA."—On Tuesday last, the launch of the largest ship in the world—the huge *Himalaya*, built by Messrs. Mare and Son, for the Peninsular and Oriental Steam-Packet Company, took place. Her length aloft is 340 feet, and at the keel, 311 feet; depth of hold, 34 ft. 9 in., and burthen 3,550 tons, being considerably more than the *Great Britain*, once the great nautical wonder of the world. The engines are equal to 700 horses power, and are expected to drive her at a rate of from 12 to 14 miles per hour. The *Himalaya* was intended originally for paddles, but subsequently was adapted to the screw. The engines are in course of construction at Messrs. Penn's. The *Himalaya* is to have an entire outfit of Trotman's patent anchors; the two bower anchors will be 48 to 50 cwt. in weight, whereas anchors of the old description would have reached five or six tons. She will have accommodation for 400 cabin passengers, 500 tons of measurement goods, and 1,200 tons of coal.

THE SUBMARINE TELEGRAPH BETWEEN GREAT BRITAIN AND IRELAND.—This important line of communication has at length been successfully effected by a submarine cable, manufactured by Messrs. Newall and Co., of Gateshead, and laid down by that firm on Monday between Donaghadee and Portpatrick. The cable consists of six communicating wires, insulated in gutta percha, and protected in the usual manner by an outer covering of iron wire. It could not be laid, as was intended, during the previous week, owing to the gales from the east preventing the opening of the dock gates at Sunderland to let the vessel containing it pass out. As several previous attempts to lay a submarine telegraph across the Irish Channel had failed, every care was taken to ensure the successful termination of the present attempt; and the expedition, consisting of the screw steamer *William Hutt* (with the cable and apparatus on board), the *Conqueror*, and the *Wizard*, left the Irish coast, having landed the end of the cable at a point about two miles to the south of Donaghadee harbour, and commenced the submersion of the cable, under the guidance of Captain Hawes, R.N., specially appointed by the Admiralty, who rendered great assistance in determining and directing the exact course to be pursued. The cable was landed on Wednesday morning, in a sandy bay (called Mora-bay), a little to the north of Portpatrick.

PROGRESS OF EDUCATION.—A Parliamentary paper, published on Wednesday, contains a return of the number of scholars in day and Sunday-schools in England and Wales, in the years 1818, 1833, and 1851. It appears from this return, that in 1818, when the population of the United Kingdom amounted to 11,642,683, there were in England 19,230 day-schools, with 674,883 scholars, and 5,463 Sunday-schools, with 477,225 scholars. In 1833, the population was estimated at 14,386,415; number of day-schools, 38,971, with 1,276,947 scholars; and 16,828 Sunday-schools, with 1,548,890 scholars. In 1851, the population was 17,927,609; there were 46,114 day-schools, with 2,144,372 scholars; and 23,498 Sunday-

schools, with 2,407,409 scholars. The proportion of day-scholars to the population in the years mentioned was as follows:—In 1818, 1 in 17·25; in 1833, 1 in 11·27; and in 1851, 1 in 8·36. The proportion of Sunday-scholars to the population was—in 1818, 1 in 24·46; in 1833, 1 in 9·20; and in 1851, 1 in 7·45.

THE ELECTRIC LIGHT.—On Friday last, one of the *Citizen* steamers started from Chelsea for Gravesend at 9 P.M., carrying an electric lamp, with a parabolic reflector on each paddle-box, returning to town at 3 A.M. The lamps brilliantly illuminated both banks of the river, shedding a flood of light on the objects and edifices in the way, including Chelsea College, the Houses of Parliament, St. Paul's, and Greenwich Hospital. The effect, as seen from the bridges, is said to have been remarkably striking and beautiful. The shipping in the Pool, below London-bridge, was as conspicuously seen as in the light of day—a most important fact in relation to the subject of safety to life at sea, and the national question of a perfect system of light-houses on the British coasts.

OCEAN PENNY POSTAGE.—A few weeks ago, when commenting on the answer made by Lord Aberdeen to the deputation of Oceanic Postage reformers, we put it to this body to reply, if they were able, in some practical way, to the assumption of the Minister that a fourpenny rate was not too much for the sea-carriage. An answer has been sent to us, giving the case of two American captains of sailing vessels, which proves—if the statement is correct, and if it be not correct the Post-office can at once contradict it—that the penny ocean rate is already in existence between this country and America. The case is this.—The two captains referred to sail to and fro between London and New York. They say, it is their custom “to leave a letter-bag for the reception of letters in some coffee-house in New York a few days before setting sail, with a notice that it will be closed at a specified hour. At the time appointed, it is locked up, brought on board, and conveyed across the Atlantic to England. On arriving off Gravesend the ship is boarded by the British Custom-house officers; and the letter-bag is put into their hands, under solemn affirmation by the captain that it contains all the mail matter on board to his knowledge. The officers then open the bag, count the letters, post them to the persons to whom they are addressed, each charged with 8d., the usual rate on sailing ship letters, and give the captain *one penny* each for his part of the service. This service includes not only the simple item of transportation across the Atlantic, but the putting up of the bag in New York, and sundry other little cares at that end of the route which are included in the inland services on letters crossing the sea and charged as such. Both these sea captains say that this has been a practice of long standing with them, and they presume a similar arrangement has been entered into with other American captains. For themselves, they were quite satisfied with what they have received for their part of the performance, for no freight in the world would pay them so well as the transportation of letters across the ocean at the rate of a penny each. They and the captains of the other American ‘liners’ would jump at the chance of conveying all the letters that crossed the sea at that figure.” These facts are curious and important. We are aware that they do not answer the whole of Lord Aberdeen’s objection,—but they unquestionably narrow it. If it be true that a penny rate will pay the cost under ordinary circumstances, it becomes the more necessary to show that the “usual conditions,” an observance of which was part of the Minister’s proposal, are necessarily so onerous as to require a tax of threepence on every letter to cover the cost.—*Athenæum*.

JUXTAPOSITION OF LEARNED SOCIETIES.—A deputation, consisting of Earl Rosse, Lord Wrottesley, Professors Bell, Forbes, and Grove, and Colonel Sabine, waited on the Earl of Aberdeen on Monday last, and presented to him a memorial, signed by a large number of the leading members of the Royal, Geological, Linnean, and Chemical Societies, in favour of the juxtaposition of the chief scientific societies of London in a convenient and central building. The deputation were most courteously received by his Lordship, who fully entered into the subject, and promised to give it his best attention.

PARLIAMENTARY REPORTS.

SESSIONAL PRINTED PAPERS.

- Par. No. *Delivered on 14th, 18th, and 19th May, 1853.*
 224 (1). Clitheroe Election—Index to Minutes of Evidence.
 273 (1). Ecclesiastical Courts—Return.
 446. Ecclesiastical Commission—Return.
 415. Mayo Election—Minutes of Evidence.
 191. Local Acts—Reports of the Admiralty.
 407. Public Works (Bengal, &c.)—Copies of Reports, &c.
 433. Bankruptcy (Ireland)—Returns.
 436. Intoxicating Liquors (Scotland)—Return.
 451. Lighthouses (Ireland)—Account.
 452. British Registered Vessels—Return.
 453. Pilotage—Returns.
 483. Education (Ireland)—Annual Report.
 455. Charitable Bequests (Ireland)—Correspondence.
 458. Timber—Copy of Memorial.
 426. Indian Territories—First Report from Committee.
 474. Bills—Transfer of Land—Ireland.
 477. „ —Probates of Wills and Grants of Administration (amended).
 480. „ —Lunacy Regulations.
 482. „ —Lunatics’ Care and Treatment.
 485. „ —Burgh Harbours (Scotland).
 486. „ —Recovery of Personal Liberty.
 495. „ —Income Tax.
 481. „ —Lunatic Asylums.
 484. „ —Copyholds (as amended in Committee, and on re commitment).
 496. „ —Customs Duties on Spirits.

Delivered on 20th May.

304. Harbours of Refuge—Return.
 450. Steam-ship *Victoria*—Report.
 472. Adulteration of Tea, &c.—Return.
 491. Income Tax—Return.

Delivered on 21st and 23rd May.

429. Bolton Election—Report from the Committee.
 456. Quarantine—Return.
 457. „ —Copy of Report.
 462. Traffic with France—Return.
 468. Poor Relief (Ireland)—Return.
 476. Butter—Return.
 490. Geographical Society—Copy of Memorials.
 494. Exchequer Bonds—Copies of Treasury Minutes.
 219 (1). Derby Election—Index to Minutes of Evidence.
 261 (7). Civil Services—Estimates, Class 7.
 488. County Treasurers (Ireland)—Account.
 493. Election Petitions—Alphabetical List.
 384. Cockermonth Election—Minutes of Evidence.
 502. Bills—Bail in Error.
 503. „ —Registration of Assurances.

PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

From Gazette, 19th May, 1853.

Dated 14th March, 1853.

635. J. O’Leary—Emigrants’ chests.
 637. J. H. Johnson—Porcelain, &c., for ornamenting. (A communication.)

Dated 15th April.

906. J. W. Duncan—New combinations of gutta percha.

Dated 19th April.

947. E. Vivian—Cases for hats.

Dated 23rd April.

977. F. Tompkins—Embossing and finishing woven fabrics.

Dated 27th April.

1027. A. G. and J. B. Anderson—Treatment of saponaceous compounds.

Dated 28th April.

1032. P. Fairbairn and F. Kaselowsky—Machinery for drawing, &c., flax, &c.

Dated May 4th.

1085. E. Walmsley—Prevention of accidents in steam boilers.
 1087. C. Videgrain—Preparation of natural and artificial stones for useful and ornamental purposes.
 1088. J. B. Giannetti—Balloons for useful purposes.
 1089. T. Masters—Apparatus for freezing, cooling, and churning.

1090. J. H. Hutchinson—Ventilating bricks.
 1091. E. J. and E. J. Ockenden—Valves and stopcocks.
 1092. J. E. Cook—Composition for preventing decay of exposed surfaces.
 1093. J. B. Verdun and J. B. Merteus—Celestial and terrestrial globes.
 1094. J. Scott Russell—Marine engines.
 1095. C. Goodyear—Combination of India-rubber with certain metals.
 1096. T. Taylor—Measuring and governing flow of liquids.
 1097. W. E. Newton—Rolling iron. (A communication.)
 1098. W. E. Newton—Treatment of fibrous substances, to ascertain moisture therein. (A communication.)
 1099. J. Walker—Turntables.

Dated 5th May.

1100. W. Moore—Furnaces.
 1101. J. D. Holdforth—Combing and dressing silk, &c.
 1103. J. Rawe—Propelling.
 1104. J. Livsey—Looms.
 1105. J. C. Stiffel—Quartz-crushing machinery. (A communication.)
 1106. M. E. Boura—Saddlery and harness.
 1107. J. Whiteley—Warp machinery.
 1108. J. Hetherington—Preparation of cotton, &c., for spinning.
 1109. T. S. Prideaux—Propelling.
 1110. T. Fearnley—Steam boilers.

Dated 6th May.

1112. C. W. Bell—Carriage-springs.
 1114. G. Dowler—Match-boxes.
 1115. A. Brackenbury—Precipitation of muriate of soda from solution.
 1116. J. R. Danks and B. Peard—Nail manufacture.
 1117. J. E. A. Gwynne—Peat for fuel.
 1118. J. T. Stroud—Valves of pressure-lamps and burners.
 1119. G. W. Jacob—Metallic covers for bottles, jars, &c.
 1120. P. A. Le Compte de Fontainemoreau—Hat-plush. (A communication.)
 1123. M. Riera—Fire-arms.
 1124. F. Capecioni—Candles.

Dated 7th May.

1125. J. Nichol—Bookbinding.
 1126. C. R. N. Palmer—Communication between guard and driver.
 1127. J. Pullman—Losh or oil-dressed leather.
 1128. H. Warner, J. Haywood, and W. Cross—Machinery for frame-work knitting.
 1129. H. Hughes and W. T. Denham—Weaving machinery.
 1130. W. Boggett and G. B. Pettit—Heating by gas.
 1132. A. Chaplin—Ships and boats.
 1133. G. England—Screw-jacks.

Dated 9th May.

1135. J. Fisher—Propelling.
 1136. D. Law—Moulding metals.
 1137. J. H. Johnson—Combing, &c., wool, &c. (A communication.)
 1138. J. H. Johnson—Coating and plating vessels, to resist acids and salts.
 1139. P. Wright—Tew irons.
 1140. T. Qualfe—Watches, watch-cases, &c.

Dated 10th May.

1142. J. Brown—Anchors.
 1143. J. T. and W. Clapham—Moulding and casting iron pipes.
 1144. T. Murray—Breaks for wheeled carriages.
 1145. G. Kane—Portable houses.
 1146. O. H. Smith and Y. Parfrey—Carriage-wheels.
 1147. R. Brown—Lifting and forcing water.
 1148. G. Tillett—Metal bedsteads.
 1149. G. and A. Robertson—Drying and finishing woven fabrics.
 1150. W. Johnson—Sewing machinery. (A communication.)
 1152. A. Chaplin—Transmission of aëriiform bodies.
 1153. G. S. Buchanan—Treatment of textile fabrics.

Dated 11th May.

1154. S. Russell—Razor-handles.
 1156. M. P. F. Mazier—Reaping-machine.

1158. J. Crabtree and T. L. Scott—Preparing and spinning cotton, &c.
 1160. R. Edmondson—Covered corded textile fabrics, and machinery for same.
 1162. T. P. Jorleson—Rafting timber, &c.
 1164. W. Bradbury and F. M. Evans—Taking impressions and producing printed surfaces. (A communication.)
 1166. J. F. Belleville—Propelling.
 1168. J. L. Stevens—Fastener for flowers.

Dated 12th May.

1172. G. F. Goble—Propelling vessels and carriages.
 1174. M. W. O'Byrne and J. Dowling—Mangles.
 1176. J. Sawtell—Economizing fuel.

APPLICATION WITH COMPLETE SPECIFICATION FILED.

1213. G. Berry—Roasting coffee, &c. 17th May, 1853.

WEEKLY LIST OF PATENTS SEALED.

Sealed 20th May, 1853.

831. William Edward Newton, of 66, Chancery-lane—Improvements in the construction of, and method of applying breaks to railroad carriages, engines, and tenders, for the purpose of preventing collisions. (A communication.)
 838. James Carter, of Trump-street—Improvements in the manufacture of certain articles of dress or apparel.
 840. John Gedge, of 4, Wellington-street, Strand—Invention of an improved self-regulating artificial incubator. (A communication.)
 924. William Slater, of Carlisle—Improvements in ovens and apparatus for baking.
 974. Edward Tucker, of Belfast—Improvements in the manufacture or production of starch.
 984. Thomas Challinor, of Bolt-court, Fleet-street—Improvements in apparatus to be applied to decanters and other bottles, to facilitate the running off liquids therefrom.
 1095. John Filmore Kingston, of Carroll County, State of Maryland, United States of America—Improvements in obtaining reciprocating motion, and in propelling and steering vessels.
 1194. James Edgar Cook, of Greenock—Invention of an improved composition for the prevention of the decay and fouling of ships' bottoms, and other exposed surfaces.
 288. Richard Archibald Brooman, of 166, Fleet-street—Improvements in expansion-valves for steam-engines. (A communication.)
 418. Thomas Clark Ogden and William Gibson, of Manchester—Improvements in machinery or apparatus for spinning cotton and other fibrous materials.
 596. Francois Valtat and Francois Marie Rouillé, of Rue Rambuteau, Paris, and 4, South-street, Finsbury—Improvements in the construction of the combs of looms for weaving.
 650. John Vandan Hielakker, of Brussels—Improved eccentric engine, applicable to the purposes of general navigation.
 678. George Mackay, of Buckingham-street, Strand—Improvements in the manufacture of iron. (A communication.)
 711. Antoine Francois Jean Claudet, of Regent-street—Improvements in stereoscopes.
 818. William Johnson, of 47, Lincoln's-inn Fields—Improvements in weaving, and in the machinery employed therein. (A communication.)

Sealed 21st May.

813. John Weems, of Johnstone, Renfrew, N.B.—Improvements in obtaining motive power.
 823. A. E. L. Belford, of 16, Castle-street, Holborn—Improvements in drying-furnaces. (A communication.)

Sealed 23rd May.

836. William Oldham, of Southam, Warwick—Invention of an improved dibble drill.
 837. Augustus Turk Forder, of Leamington Priors, Warwick—Improvements in fenders for railway carriages.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

Date of Registration.	No. in the Register.	Title.	Proprietor's Name.	Address.
May 19	3461	Railway Roof Lamp	Thornton and Sons	Birmingham.
" 20	3462	Writing-desk	John William and Thomas Allen	18 and 22, Strand.
" 21	3463	Improved Tallow Lamp	George Burt	Birmingham
" 23	3464	Clover-rubber, for extracting the Seed from Clover-heads	William Batley and John Rivet	Bridge-street Works, Northampton, and Brighton, Huntingdonshire.